

**ABSTRACT**

To provide an electron source to be used for a surface analyzer such as a scanning or transmission electron microscope or an Auger electron spectroscope, or 5 an electron beam lithography machine, particularly for a semiconductor wafer inspection apparatus such as a scanning electron microscope to be used at a low acceleration with an electron beam acceleration voltage of up to 1 kV, CD SEM or DR SEM.

10 An electron source wherein a barium supplying source consisting of a complex oxide comprising barium oxide and an oxide of metal other than barium, is provided at a portion of a single crystal needle of tungsten or molybdenum.